Patent Claims

1. Method for optimizing the plates of a plate-link chain for use in a variable speed unit of a belt-driven conical-pulley transmission, which plate-link chain has plates arranged behind one another in several rows arranged next to another transversely in relation to the direction of motion of the plate-link chain, wherein said plates overlap transversely in relation to the direction of motion and are connected by means of rocker members penetrating them transversely in relation to the direction of motion, wherein an opening of each plate is penetrated by two rocker member pairs, whose rocker members which face away from each other rest against the front or rear inside of the plate opening, and whose rocker members which face one another rest against the front or rear inside of plate openings of adjacent plates, wherein the surfaces of the rocker members of each rocker member pair facing each other roll against each other when the plate-link chain bends, in which method the transmission of force from the rocker members into the plates occurs such that the bending stress of the longitudinal legs extending in the direction of motion or the vertical legs extending perpendicular to the direction of motion of the plates resulting from the force transmission is minimized in given boundary conditions.

2. Method according to claim 1, wherein the bending moment (MB) of the longitudinal legs is minimized for the plate-link chain corresponding to the following formula in given boundary conditions:

$$MB = \frac{F * He}{k+1} \bullet \left[1 - \frac{He}{L2}\right]$$ with $k = \frac{I2 * L1}{I1 * L2}$, wherein

F = force introduced

He = lever arm of the force introduced F

I1 = surface inertial factor of the longitudinal leg (= leg height^3*thickness/12)

I2 = surface inertial factor of the vertical leg (= leg width^3*thickness/12)

L1 = overall length of the longitudinal leg

L2 = overall length of the vertical leg.

3. Method according to claim 1 or 2, wherein the bending moment (MA) of the vertical legs is minimized for the plate-link chain corresponding to the following formula in given boundary conditions:

$$MA = F * He * \left[1 - \frac{1}{k+1} \bullet \left(1 - \frac{He}{L2}\right) - \right]$$ with $k = \frac{I2 * L1}{I1 * L2}$, wherein

F = force introduced

He = lever arm of the force introduced F

I1 = surface inertial factor of the longitudinal leg (= leg height^3*thickness/12)

I2 = surface inertial factor of the vertical leg (= leg width^3*thickness/12)

L1 = overall length of the longitudinal leg

L2 = overall length of the vertical leg.

4. Plate for a plate-link chain for use in a variable speed unit of a belt-driven conical pulley transmission, with said plate-link chain comprising plates arranged

behind one another in several rows arranged next to another transversely in relation to the direction of motion of the plate-link chain, wherein said plates overlap transversely in relation to the direction of motion and are connected by means of rocker members penetrating them transversely in relation to the direction of motion, wherein an opening of each plate is penetrated by two rocker member pairs, whose rocker members which face away from each other rest against the front or rear inside of the plate opening, and whose rocker members which face one another rest against the front or rear inside of plate openings of adjacent plates, wherein the surfaces of the rocker members of each rocker member pair that face each other roll against each other when the plate-link chain bends, wherein the plate is dimensioned such that the bending stress applied to the longitudinal legs extending in the direction of motion of the plate-link chain or the vertical legs extending perpendicular to the direction of motion of the plate-link chain due to the transmission of force from the rocker members is minimal in given boundary conditions.

5. Plate according to claim 1, wherein the bending moment (MB) of the longitudinal legs is minimal for the plate-link chain corresponding to the following formula in given boundary conditions:

$$MB = \frac{F * He}{k+1} \bullet \left[1 - \frac{He}{L2}\right] \qquad \text{with} \quad k = \frac{I2 * L1}{I1 * L2}\text{, wherein}$$

F = force introduced

He = lever arm of the force introduced F

I1 = surface inertial factor of the longitudinal leg (= leg height^3*thickness/12)

I2 = surface inertial factor of the vertical leg (= leg width^3*thickness/12)

L1 = overall length of the longitudinal leg

L2 = overall length of the vertical leg.

6. Plate according to claim 4 or 5, wherein the bending moment (MA) of the vertical legs is minimal for the plate-link chain corresponding to the following formula in given boundary conditions:

$$MA = F * HE * \left[1 - \frac{1}{k+1} \bullet \left(1 - \frac{He}{L2}\right) - \right] \qquad \text{with} \quad k = \frac{I2 * L1}{I1 * L2}, \text{ wherein}$$

F = force introduced

He = lever arm of the force introduced F

I1 = surface inertial factor of the longitudinal leg (= leg height^3*thickness/12)

I2 = surface inertial factor of the vertical leg (= leg width^3*thickness/12)

L1 = overall length of the longitudinal leg

L2 = overall length of the vertical leg.

7. Plate according to claim 5 or 6, wherein 1 < k < 3.5.